

KAWA, STEPHAN R.

REFEREED PUBLICATIONS:

1. "Dynamics and Chemistry of Marine Stratocumulus (DYCOMS) Experiment," D. H. Lenschow, I. R. Paluch, A. R. Bandy, R. Pearson, Jr., S. R. Kawa, C. J. Weaver, B. J. Huebert, J. G. Kay, D. C. Thornton, and A. R. Driedger III, *Bull. Amer. Meteor. Soc.*, **69**, 1058-1067, 1988.
2. "Ozone budgets from the Dynamics and Chemistry of Marine Stratocumulus Experiment," S. R. Kawa and R. Pearson, Jr., *J. Geophys. Res.*, **94**, 9809-9817, 1989.
3. "An Observational Study of Stratocumulus Entrainment and Thermodynamics," S. R. Kawa and R. Pearson, Jr., *J. Atmos. Sci.*, **46**, 2649-2661, 1989.
4. "Nitric Oxide Measurements in the Arctic Winter Stratosphere," D. W. Fahey, S. R. Kawa, and K. R. Chan, *Geophys. Res. Lett.*, **17**, 489-492, 1990.
5. "Measurements of Total Reactive Nitrogen During the Airborne Arctic Stratospheric Expedition," S. R. Kawa, D. W. Fahey, L. C. Anderson, M. Loewenstein, and K. R. Chan, *Geophys. Res. Lett.*, **17**, 485-488, 1990.
6. "Observations of Denitrification and Dehydration in the Winter Polar Stratospheres," D. W. Fahey, K. K. Kelly, S. R. Kawa, A. F. Tuck, M. Loewenstein, K. R. Chan, and L. E. Heidt, *Nature*, **344**, 321-324, 1990.
7. "A Diagnostic for Denitrification in the Winter Polar Stratospheres," D. W. Fahey, S. Solomon, S. R. Kawa, M. Loewenstein, J. R. Podolske, S. E. Strahan, and K. R. Chan, *Nature*, **345**, 698-702, 1990.
8. "Interpretation of Aircraft Measurements of NO, ClO, and O₃ in the Lower Stratosphere," S. R. Kawa, D. W. Fahey, S. Solomon, W. H. Brune, M. H. Proffitt, D. W. Toohey L. C. Anderson, and K. R. Chan, *J. Geophys. Res.*, **95**, 18,597-18,609, 1990.
9. "The Potential for Ozone Depletion in the Arctic Polar Stratosphere," W. H. Brune, J. G. Anderson, D. W. Toohey, D. W. Fahey, S. R. Kawa, R. L. Jones, D. S. McKenna, and L. R. Poole, *Science*, **252**, 1260-1266, 1991.
10. "Polar Stratospheric Clouds," D. W. Fahey and S. R. Kawa, *Encyclopedia of Earth System Science*, Academic Press, 661-671, 1991.
11. "Particle Size Distributions in Arctic Polar Stratospheric Clouds: Growth and Nucleation of Sulfuric Acid Droplets and Implications for Cloud Formation," J. E. Dye, D. Baumgardner, B. W. Gandrud, S. R. Kawa, K. K. Kelly, M. Loewenstein, G. V. Ferry, and B. L. Gary, *J. Geophys. Res.*, **97**, 8015-8034, 1992.
12. "PSC-Processed Air and Potential Vorticity in the Northern Hemisphere Lower Stratosphere at Mid-latitudes During Winter," A. F. Tuck, T. Davies, S. J. Hovde, M. Noguer-Alba, D. W. Fahey, S. R. Kawa, K. K. Kelly, D. M. Murphy, M. H. Proffitt, J. J. Margitan, M. Loewenstein, J. R. Podolske, S. E. Strahan, and K. R. Chan," *J. Geophys. Res.*, **97**, 7883-7904, 1992.

REFEREED PUBLICATIONS (continued):

13. "The Arctic Polar Stratospheric Clouds Aerosol: Aircraft Measurements of Reactive Nitrogen, Total Water, and Particles," S. R. Kawa, D. W. Fahey, K.K. Kelly, J. E. Dye, D. Baumgardner, B. W. Gandrud, M. Loewenstein, G. V. Ferry, and K. R. Chan, *J. Geophys. Res.*, **97**, 7925-7938, 1992.
14. "Photochemical Partitioning of the Reactive Nitrogen and Chlorine Reservoirs in the High Latitude Stratosphere," S. R. Kawa, D. W. Fahey, L. E. Heidt, W. H. Pollock, S. Solomon, D. E. Anderson, M. Loewenstein, M. H. Proffitt, J. J. Margitan, and K. R. Chan, *J. Geophys. Res.*, **97**, 7905-7923, 1992.
15. "New Observations of NOy/N₂O Correlation in the Lower Stratosphere," M. Loewenstein, J. R. Podolske, D. W. Fahey, E. L. Woodbridge, P. Tin, A. Weaver, P. A. Newman, S. E. Strahan, S. R. Kawa, M. R. Schoeberl, L. R. Lait, *Geophys. Res. Lett.*, **20**, 2531-2534, 1993.
16. "Reactive Nitrogen and its Correlation with Ozone in the Lower Stratosphere and Upper Troposphere," D. M. Murphy, D. W. Fahey, M. H. Proffitt, S. C. Liu, K. R. Chan, C. S. Eubank, S. R. Kawa, and K. K. Kelly, *J. Geophys. Res.*, **98**, 8751-8773, 1993.
17. "In situ Measurements Constraining the Role of Sulphate Aerosols in Mid-latitude Ozone Depletion," D. W. Fahey, S. R. Kawa, E. L. Woodbridge, P. Tin, J. C. Wilson, H. H. Jonsson, J. E. Dye, D. Baumgardner, S. Borrmann, D. W. Toohey, L. M. Avallone, M. H. Proffitt, J. J. Margitan, M. Loewenstein, R. J. Salawitch, S. C. Wofsy, M. K. W. Ko, D. E. Anderson, M. R. Schoeberl, and K. R. Chan, *Nature*, **363**, 509-514, 1993.
18. "Interpretation of NOx/NOy Observations from AASE-II Using a Model of Chemistry Along Trajectories," S. R. Kawa, D. W. Fahey, J. C. Wilson, M. R. Schoeberl, A. R. Douglass, R. S. Stolarski, E. L. Woodbridge, H. Jonsson, L. R. Lait, P. A. Newman, M. H. Proffitt, D. E. Anderson, M. Loewenstein, K. R. Chan, C. R. Webster, R. D. May, and K. K. Kelly, *Geophys. Res. Lett.*, **20**, 2507-2510, 1993.
19. "Missing Chemistry of Reactive Nitrogen in the Upper Stratospheric Polar Winter," S. R. Kawa, J. B. Kumer, A. R. Douglass, A. E. Roche, S. E. Smith, F. W. Taylor, and D. J. Allen, *Geophys. Res. Lett.*, **22**, 2629-2632, 1995.
20. "A Test of the Partitioning Between ClO and ClONO₂ Based on Simultaneous UARS Measurements of ClO, NO₂, and ClONO₂," A. E. Dessler, S. R. Kawa, A. R. Douglass, D. B. Considine, J. B. Kumer, A. E. Roche, J. W. Waters, J. M. Russell, III, and J. C. Gille, *J. Geophys. Res.*, **101**, 12,515-12,521, 1996.
21. "UARS Measurements of ClO and NO₂ at 40 and 46 km and Implications for the 'Ozone Deficit,'" A. E. Dessler, S. R. Kawa, D. B. Considine, J. B. Kumer, J. W. Waters, L. Froidevaux, and J. M. Russell, III, *Geophys. Res. Lett.*, **23**, 339-342, 1996.
22. "Interpretation of Nitric Oxide Profile Observed in January 1992 over Kiruna," Y. Kondo, S. R. Kawa, D. Lary, T. Sugita, A. R. Douglass, E. Lutman, M. Koike, and T. Deshler, *J. Geophys. Res.*, **101**, 12,555-12,566, 1996.

REFEREED PUBLICATIONS (continued):

23. "Development of the Antarctic Ozone Hole," M. Schoeberl, A. Douglass, S. R. Kawa, A. Dessler, P. Newman, R. Stolarski, A. Roche, J. Waters, C. Froidevaux, and J. Russell III, *J. Geophys. Res.*, **101**, 20,909-20,924, 1996.
24. "Activation of Chlorine in Sulfate Aerosol as Inferred from Aircraft Observations," S. R. Kawa, P. A. Newman, L. R. Lait, M. R. Schoeberl, R. M. Stimpfle, D. W. Kohn, C. R. Webster, R. D. May, D. Baumgardner, J. E. Dye, J. C. Wilson, K. R. Chan, and M. Loewenstein, *J. Geophys. Res.*, **102**, 3921-3933, 1997.
25. "UARS First Global N₂O₅ Data Sets: Application to a Stratospheric Warming Event in January 1992," J. B. Kumer, S. R. Kawa, A. E. Roche, J. L. Mergenthaler, S. E. Smith, F. W. Taylor, P. S. Connell, and A. R. Douglass, *J. Geophys. Res.*, **102**, 3575-3582, 1997.
26. "Lower Stratospheric Chlorine Partitioning During the Decay of the Mt. Pinatubo Aerosol Cloud," A. E. Dessler, D. B. Considine, S. R. Kawa, A. R. Douglass, and J. M. Russell, *Geophys. Res. Lett.*, **24**, 1623-1626, 1997.
27. "Nitrogen Partitioning in the Middle Stratosphere as Observed by the Upper Atmosphere Research Satellite," G. A. Morris, D. B. Considine, A. E. Dessler, S. R. Kawa, J. Kumer, J. Mergenthaler, A. Roche, and J. M. Russell, III, *J. Geophys. Res.*, **102**, 8955-8965, 1997.
28. "Partitioning of the Reactive Nitrogen Reservoir in the Lower Stratosphere of the Southern Hemisphere: Observations and Modeling," R. S. Gao, D. W. Fahey, R. J. Salawitch, S. A. Lloyd, D. E. Anderson, R. DeMajistre, C. T. McElroy, E. L. Woodbridge, R. C. Wamsley, S. G. Donnelly, L. A. Del Negro, M. H. Proffitt, R. M. Stimpfle, D. W. Kohn, S. R. Kawa, L. R. Lait, M. Loewenstein, J. R. Podolske, E. R. Keim, J. E. Dye, J. C. Wilson, and K. R. Chan, *J. Geophys. Res.*, **102**, 3935-3949, 1997.
29. "Observations of Large Reductions in the NO/NO_y Ratio Near the Mid-Latitude Tropopause and the Role of Heterogeneous Chemistry," E. R. Keim, D. W. Fahey, L. A. Del Negro, E. L. Woodbridge, R. S. Gao, P. O. Wennberg, R. C. Cohen, R. M. Stimpfle, K. K. Kelly, E. J. Hintsa, J. C. Wilson, H. H. Jonsson, J. E. Dye, D. Baumgardner, S. R. Kawa, R. J. Salawitch, M. H. Proffitt, M. Loewenstein, J. R. Podolske, and K. R. Chan, *Geophys. Res. Lett.*, **23**, 3223-3226, 1997.
30. "An Analysis of Tropical Transport: Influence of the QBO," E. Cordero, S. R. Kawa, and M. R. Schoeberl, *J. Geophys. Res.*, **102**, 16,453-16,461, 1997.
31. "A 3-D Simulation of the Evolution of the Middle Latitude Winter Ozone in the Middle Stratosphere," A. R. Douglass, R. B. Rood, S. R. Kawa, and D. J. Allen, *J. Geophys. Res.*, **102**, 19,217-19,232, 1997.
32. "Low-Ozone Pockets Explained," G. A. Morris, S. R. Kawa, A. R. Douglass, M. R. Schoeberl, L. Froidevaux, and J. Waters, *J. Geophys. Res.*, **103**, 3599-3610, 1998.
33. "Contrast Between 1992 and 1997 High Latitude Spring Halogen Occultation Experiment Observations of Lower Stratospheric HCl," A. R. Douglass and S. R. Kawa, *J. Geophys. Res.*, **104**, 18,739-18,754, 1999.

REFEREED PUBLICATIONS (continued):

34. "Preface" (to the POLARIS special section), P. A. Newman, D. W. Fahey, W. H. Brune, M. J. Kurylo, S. R. Kawa, *J. Geophys. Res.*, **104**, 26,481-26,495, 1999.
35. "Partitioning of Reactive Nitrogen in the Midlatitude Lower Stratosphere," Kondo, Y., T. Sugita, M. Koike, S. R. Kawa, M. Y. Danilin, J. M. Rodriguez, S. Spreng, K. Golinger, F. Arnold, *J. Geophys. Res.*, **105**, 1417-1424, 2000.
36. "The Influence of Airmass Histories on Radical Species During POLARIS," J. M. Pierson, S. R. Kawa, R. J. Salawitch, T. F. Hanisco, E. J. Lanzendorf, K. K. Perkins, R. S. Gao, *J. Geophys. Res.*, **105**, 15,185-15,199, 2000.
37. "Ozone Destruction and Production Rates Between Spring and Autumn in the Arctic Stratosphere," D. W. Fahey, R. S. Gao, L. A. Del Negro, E. R. Keim, S. R. Kawa, R. J. Salawitch, P. O. Wennberg, et al., *Geophys. Res. Lett.*, **27**, 2605-2608, 2000.
38. "A Composite View of Ozone Evolution in the 1995-96 Northern Winter Polar Vortex Developed from Airborne Lidar and Satellite Observations," A. R. Douglass, M. R. Schoeberl, S. R. Kawa, E. V. Browell, *J. Geophys. Res.*, **106**, 1669-1691, 2001.
39. "The Global Modeling Initiative Assessment Model: Application to High Speed Civil Transport perturbation," D. E. Kinnison, P. S. Connell, J. M. Rodriguez, D. A. Rotman, D. B. Considine, J. Tannahill, R. Ramaroson, P. J. Rasch, A. R. Douglass, S. L. Baughcum, L. Coy, D. W. Waugh, S. R. Kawa, and M. J. Prather, *J. Geophys. Res.*, **106**, 1693-1711, 2001.
40. "The Global Modeling Initiative Assessment Model: Model Description, Integration and Testing of the Transport Shell," D. A. Rotman, J. R. Tannahill, D. E. Kinnison, P. S. Connell, D. Bergmann, D. Proctor, J. M. Rodriguez, S. J. Lin, R. B. Rood, M. J. Prather, P. J. Rasch, D. B. Considine, R. Ramaroson, S. R. Kawa, *J. Geophys. Res.*, **106**, 9879-9895, 2001.
41. "Ozone and tracer transport variations in the summer northern hemisphere stratosphere," E. C. Cordero and S. R. Kawa, *J. Geophys. Res.*, **106**, 12,227-12,239, 2001.
42. "The interaction between dynamics and chemistry of ozone in the set-up phase of the northern hemisphere polar vortex," S. R. Kawa, R. Bevilacqua, J. J. Margitan, A. R. Douglass, M. R. Schoeberl, K. Hoppel, and B. Sen, *J. Geophys. Res.*, **107**, 8310, doi: 10.1029/2001JD001527, 2002.
43. "Evaluation of the transport in the Goddard Space Flight Center three-dimensional chemical transport model using the equivalent length diagnostic," J. Ma, D. Waugh, A. R. Douglass, S. R. Kawa, and S.-J. Lin, *J. Geophys. Res.*, **108**, D6, 4201, doi: 10.1029/2002JD002268, 2003.

REFEREED PUBLICATIONS (continued):

44. "N₂O and NO_y observations in the 1999/2000 Arctic polar vortex: Implications for transport processes in a CTM", D. B. Considine, S. R. Kawa, M. R. Schoeberl, A. R. Douglass, *J. Geophys. Res.*, **108**, D5, 4170, doi:10.1029/2002JD002525, 2003
45. "Sensitivity studies for space-based measurement of atmospheric total column carbon dioxide by reflected sunlight," J. Mao and S. R. Kawa, *Applied Optics*, **43**, 914-927, 2004.
46. "Global CO₂ transport simulations using meteorological data from the NASA data assimilation system," S. R. Kawa, D. J. Erickson, III, S. Pawson, and Z. Zhu, *J. Geophys. Res.*, **109**, D18312, doi:10.1029/2004JD004554, 2004.
47. "Use of radon for evaluation of atmospheric transport models: Sensitivity to emissions," Gupta, M., A. R. Douglass, S. R. Kawa, and S. Pawson, *Tellus*, **56B**, 404-412, 2004.
48. "Interannual variability of stratospheric trace gases: Role of extratropical wave driving," J. Ma, D. W. Waugh, A. R. Douglass, S. R. Kawa, P. A. Newman, S. Pawson, R. Stolarski, and S. J. Lin, *Q.J.R. Meteorol. Soc.*, **130**, 2459-2474, 2004.
49. "On the size of the Antarctic ozone hole," P. A. Newman, S. R. Kawa, and E. R. Nash, *Geophys. Res. Lett.*, **31**, Art. No. L21104, 2004.
50. "Sensitivity of atmospheric CO₂ inversions to seasonal and interannual variations in fossil fuel emissions," K. R. Gurney, Y.-H. Chen, T. Maki, S. R. Kawa, A. E. Andrews, and Z. Zhu, *J. Geophys. Res.*, **110**, D10308, doi:10.1029/2004JD005373, 2005.
51. "Intercontinental transport and its synoptic to interannual variations, " M. L. Gupta, A. R. Douglass, S. R. Kawa, S. Pawson, J. E. Nielsen, *J. Geophys. Res.*, **submitted**, 2005.
52. "Fall vortex ozone as a predictor of springtime total ozone at high northern latitudes, " S. R. Kawa, P. A. Newman, R. S. Stolarski, R. M. Bevilacqua, *Atmos. Chem. Phys.*, **5**, 1655-1663, 2005.
53. "A test of sensitivity to convective transport in a global atmospheric CO₂ simulation, " H. Bian, S. R. Kawa, M. Chin, S. Pawson, Z. Zhu, P. Rasch, S. Wu, *Tellus B*, **58**, Issue 5, 463-475, 2006.
54. "When will the Antarctic ozone hole recover? " P. A. Newman, E. R. Nash, S. R. Kawa, S. A. Montzka, S. M. Schauffler, *Geophys. Res. Lett.*, **33**, L12814, doi:10.1029/2005GL025232, 2006.
55. "Chemical observations of a polar vortex intrusion," M. R. Schoeberl, S. R. Kawa, A. R. Douglass, T. J. McGee, E. V. Browell, J. Waters, N. Livesey, W. Read, L. Froidevaux, M. L. Santee, H. C. Pumphrey, L. R. Lait, L. Twigg, *J. Geophys. Res.*, **111**, D20306, doi:10.1029/2006JD007134, 2006.
56. "Stratospheric Transport using Six-Hour Averaged Winds from a Data Assimilation System," S. Pawson, I. Stajner, S. R. Kawa, H. Hayashi, W.-W. Tan, J. E. Nielsen, Z. Zhu, L.-P. Chang, N. J. Livesey, *J. Geophys. Res.*, doi:10.1029/2006JD007673, 2007.

KAWA, STEPHAN R.

REFEREED PUBLICATIONS (continued):

57. "Sensitivity of global CO simulation to uncertainties in biomass burning sources," H. Bian, M. Chin, S. R. Kawa, B. Duncan, A. Arellano, P. Kasibhatla, *J. Geophys. Res.*, in press, 2007.
58. "Estimated monthly global emissions of anthropogenic CO₂ and their impact on calculated atmospheric CO₂," D. J. Erickson, III, R. T. Mills, J. Gregg, T. J. Blasing, F. M. Hoffman, R. J. Andres, M. Devries, Z. Zhu, S. R. Kawa, *J. Geophys. Res.*, in press, 2007.
59. "TransCom model simulations of hourly atmospheric CO₂: Experimental overview and diurnal cycle results for 2002," R. M. Law, W. Peters, C. Rodenbeck, C. Aulagnier, I. Baker, D. J. Bergmann, P. Bousquet, J. Brandt, L. Bruhwiler, P. J. Cameron-Smith, J. H. Christensen, F. Delage, A. S. Denning, S. Fan, C. Geels, S. Houweling, R. Imasu, U. Karstens, S. R. Kawa, et al., *Global Biochem. Cycles*, submitted, 2007.

KAWA, STEPHAN R.

OTHER REPORTS, PAPERS:

1. "Ozone Deposition, Scalar Budgets, and Radiative Heating Over Texas Coastal Forest and Ocean," S. R. Kawa, Colorado State University Department of Atmospheric Science Paper no. 398, 1986.
2. "The Chemistry and Dynamics of Marine Stratocumulus," S. R. Kawa, Colorado State University Department of Atmospheric Science Paper no. 430, 1988.
3. "Correlation of Long-lived Species in Simultaneous Observations," S. R. Kawa, R. A. Plumb, and U. Schmidt, in *The Atmospheric Effects of Stratospheric Aircraft: Report of the 1992 Models and Measurements Workshop*, E. E. Remsberg and M. P. Prather, eds., NASA Reference Publication 1292, 1993.
4. "Assessment of the Effects of High-speed Aircraft in the Stratosphere: 1998," S. R. Kawa, J. G. Anderson, S. L. Baughcum, C. A. Brock, W. H. Brune, R. C. Cohen, D. E. Kinnison, P. A. Newman, J. M. Rodriguez, R. S., Stolarski, D. Waugh, S. C. Wofsy, NASA Technical Publication, NASA/TP-1999-209237, 1999.
5. "Lower Stratospheric Processes," A. R. Ravishankara, T. G. Shepherd, M. P. Chipperfield, P. H. Haynes, S. R. Kawa, T. Peter, R. A. Plumb, R. W. Portmann, W. J. Randel, D. W. Waugh, D. R. Worsnop, in *Scientific Assessment of Ozone Depletion: 1998*, United Nations Environment Programme/World Meteorological Organization, 1999.
6. "Potential Climate Impacts of Engine Particle Emissions," S. R. Kawa, in *Workshop on Aerosols and Particulates From Aircraft Gas Turbine Engines*, NASA Conference Proceedings, NASA/CP-1999-208918, 1999.
7. "Assessing the Impact of Aircraft Emissions on the Stratosphere," S. R. Kawa and D. E. Anderson, SPARC Newsletter, No. 13, 21-26, 1999.
8. "Science and Observation Recommendations for a NASA Carbon Cycle Initiative," C. R. McClain, F. G. Hall, G. J. Collatz, S. R. Kawa, W. W. Gregg, et al., NASA Technical Memorandum, NASA/TM-2002-210009, 2002.
9. "Cost Analysis for a Recommended NASA Carbon Cycle Initiative," J. C. Gervin, P. S. Caruso, L. A. DeMaio, C. R. McClain, F. G. Hall, G. J. Collatz, S. R. Kawa, W. W. Gregg, et. al., NASA Technical Memorandum, NASA/TM-2002-210007, 2002.
10. "Fabry-Perot Interferometer for Column CO₂," W. S. Heaps and S. R. Kawa, NASA Earth Science Technology Conference Proceedings, <http://esto.nasa.gov/conferences/estc-2002/Agenda.html>, 2002.
11. "Passive Measurement of CO₂ Column from an Airborne Platform," W. S. Heaps, S. R. Kawa, E. Wilson, and E. Georgieva, NASA Earth Science Technology Conference Proceedings, <http://esto.nasa.gov/conferences/estc2004/author.html>, 2004.

KAWA, STEPHAN R.

OTHER REPORTS, PAPERS:

12. "Measurement of atmospheric carbon dioxide column from space using reflected sunlight," J. Mao and S. R. Kawa, Remote Sensing of Clouds and the Atmosphere VIII, Proc. of SPIE, 5235, 336-346, SPIE, Bellingham, WA, 2004.
13. "Global Ozone: Past and Present" M. P. Chipperfield, V. E. Fioletov, B. Bregman, J. Burrows, B. Connor, J. D. Haigh, N. Harris, A. Hauchecome, L. Hood, S. R. Kawa, et al., in *Scientific Assessment of Ozone Depletion: 2006*, United Nations Environment Programme/World Meteorological Organization, 2007.